

Notice of Allowability

Application No.

10/065,219

Applicant(s)

ARNO ET AL.

Examiner

Art Unit

Edna Wong

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

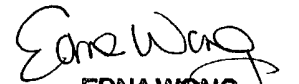
1. ☒ This communication is responsive to Amendment After Final dated August 10, 2004.
2. ☒ The allowed claim(s) is/are 32-46, 48-53, 55-60, 62, 66-71 and 73.
3. ☒ The drawings filed on 7/7/04 & 8/10/04 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


EDNA WONG
PRIMARY EXAMINER

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The application has been amended as follows:

IN THE CLAIMS

Claim 32, line 10, the word "a" has been deleted and replaced with the word -- the --.

REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance:

Claims **32-46, 48-53, 56-60 and 73** are allowable over the prior art of record because the prior art does not teach or suggest a method for *in-situ* generation of fluorine radicals and/or fluorine-containing interhalogen compounds for use in cleaning a semiconductor processing chamber, comprising the steps of (a) providing and (b) providing as presently claimed, esp., wherein said method is characterized by at least one of the sequences (I), (II) and (III) as presently claimed.

Claim **55** is allowable over the prior art of record because the prior art does not teach or suggest a method for *in-situ* generation of fluorine radicals and/or fluorine-containing interhalogen compounds for use in cleaning a semiconductor processing

chamber, comprising the steps of (a) providing, (b) providing, (c) flowing, (d) generating, (e) flowing and (f) flowing as presently claimed, esp., the steps of (e) flowing the generated fluorine radicals and/or fluorine-containing interhalogen compounds from the mixing chamber into a holding chamber for storage until a pre-determined pressure threshold is reached and (f) flowing the generated fluorine radicals and/or fluorine-containing interhalogen compounds from the holding chamber into the semiconductor processing chamber to effect cleaning therein, wherein the flow rate of the formed fluorine radicals and/or fluorine-containing interhalogen compound from the holding chamber into the semiconductor processing chamber is monitored and controlled.

Claim **62** is allowable over the prior art of record because the prior art does not teach or suggest a method for generating chlorine trifluoride, comprising the steps of (a) providing, (b) providing, (c) flowing and (d) supplying as presently claimed, esp., the steps of (c) flowing fluorine gas and chlorine gas from said gas sources into a semiconductor processing chamber; and (d) supplying photoenergy to said processing chamber from a photoenergy source to facilitate generation of chlorine trifluoride in the semiconductor processing chamber.

Claims **66-68** are allowable over the prior art of record because the prior art does not teach or suggest a method for generating fluorine radicals and/or fluorine-containing interhalogen compounds, comprising the steps of (i) providing, (ii) providing, (iii) providing, (iv) mixing, (v) supplying and (vi) supplying as presently claimed, esp., the steps of (v) supplying photoenergy to said enclosure from a photoenergy source to

facilitate generation of the fluorine radicals and/or fluorine-containing interhalogen compounds and (vi) supplying the inert gas to the enclosure to dilute the generated fluorine radicals and/or fluorine-containing interhalogen compounds.

Claims **69-71** are allowable over the prior art of record because the prior art does not teach or suggest a method for *in-situ* generation of fluorine radicals and/or fluorine-containing interhalogen compounds for use in cleaning a semiconductor processing chamber, comprising the steps of (a) providing, (b) providing, (c) providing, (d) flowing, (e) generating, (f) flowing and (g) flowing, esp., the step of (g) flowing the diluent gas into the semiconductor processing chamber to dilute the fluorine radicals and/or fluorine-containing interhalogen compounds contained therein.

The prior art does not contain any language that teaches or suggests the above. Therefore, a person skilled in the art would not have been motivated to adopt the above conditions, and a prima facie case of obviousness cannot be established.

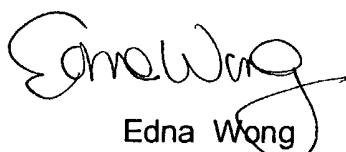
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 3:30 pm, Flex

Schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Edna Wong
Primary Examiner
Art Unit 1753

EW
September 1, 2004